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# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>112111PA</b>	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. <b>PCT/SE 00/01892</b>	International filing date ( <i>day/month/year</i> ) <b>02/10/2000</b>	Priority date ( <i>day/month/year</i> ) <b>12/10/1999</b>
International Patent Classification (IPC) or national classification and IPC <sub>7</sub> <b>B60R 22/20</b>		
Applicant <b>Volvo Lastvagnar AB; et al</b>		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of \_\_\_\_\_ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  <b>23/04/2001</b>	Date of completion of this report  <b>30/01/2002</b>
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. 08-667 72 88	Authorized officer  <b>Hans Nordström/JAN</b> Telephone No. 08-782 25 00

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE 00/01892

## I. Basis of the report

### 1. With regard to the **elements** of the international application:\*

- ☒ the international application as originally filed
- ☐ the description:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the claims:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, as amended (together with any statement) under article 19  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the drawings:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

### 2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language English which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☒ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

### 3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

### 4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheet/fig \_\_\_\_\_

### 5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2 (c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE 00/01892

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	<u>1-12</u>	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	<u>1-12</u>	NO
Industrial applicability (IA)	Claims	<u>1-12</u>	YES
	Claims		NO

## 2. Citations and explanations (Rule 70.7)

## Cited documents:

EP 0447364 A1 (INDIANA MILLS & MANUFACTURING, INC), 18 September 1977 (15.12.77) (a)

DE 2625417 A1 (DAIMLER-BENZ AG), 15 December 1977 (15.12.77) (b)

Document (a) reveals an arrangement which corresponds with the preamble of claim 1. The invention according to claim 1 differs from here in the sense that the upper attachment point is arranged displaceably in the vertical direction on the body of the vehicle and is connected to the vehicle seat via movement-transmitting means which cause the springing movement of the vehicle seat to bring about a corresponding displacement of the upper attachment point. From document (b) a height-adjusting arrangement for the upper attachment point of a safety belt is known in which the upper attachment point is arranged displaceably in the vertical direction on the body of the vehicle and is connected to the vehicle seat via movement-transmitting means which cause movement of the vehicle seat in the vertical direction to bring about a corresponding displacement of the upper attachment point. To apply this art to an arrangement known from document (a), i.e. to an arrangement in which the vehicle seat is spring-mounted in a vertical direction is considered obvious to a person skilled in the art. Consequently, claim 1 lacks an inventive step.

The invention according to claims 4-7 and 10 is known per se from document (b) and claims 4-7 and 10 lack an inventive step.

.../...

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

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**Supplemental Box**

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Box V

Claims 2, 3, 8 and 9 are considered to deal with obvious matters of design and claim 2, 3, 8 and 9 lack an inventive step. ←

Document (a) reveals a method which corresponds with the preamble of claim 11. The method according to claim 11 differs from here in the sense that the height adjustment takes place as a function of the springing movement of the vehicle seat. From document (b) a method of height-adjustment of the upper attachment point of a safety belt is known in which height-adjustment takes place as a function of the vertical movement of the vehicle seat. To apply this art to a method known from document (a), i.e. to a method in which the vehicle seat is spring-mounted in a vertical direction is considered obvious to a person skilled in the art. Consequently, claim 11 lacks an inventive step. ←

The method claimed in claim 12 is considered obvious to a person skilled in the art and claim 12 lacks an inventive step. ←

## PATENT COOPERATION TREATY

2000-12-27

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION CONCERNING  
SUBMISSION OR TRANSMITTAL  
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

To:

ALBIHNS PATENTBYRÅ GÖTEBORG AB  
Box 142  
S-401 22 Göteborg  
SUÈDE

Date of mailing (day/month/year) 14 December 2000 (14.12.00)	
Applicant's or agent's file reference 112111 PA	<b>IMPORTANT NOTIFICATION</b>
International application No. PCT/SE00/01892	International filing date (day/month/year) 02 October 2000 (02.10.00)
International publication date (day/month/year) Not yet published	Priority date (day/month/year) 12 October 1999 (12.10.99)
Applicant VOLVO LASTVAGNAR AB et al	

1. The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
2. This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.
3. An asterisk(\*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, **the attention of the applicant is directed to Rule 17.1(c)** which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
4. The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, **the attention of the applicant is directed to Rule 17.1(c)** which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

<u>Priority date</u>	<u>Priority application No.</u>	<u>Country or regional Office or PCT receiving Office</u>	<u>Date of receipt of priority document</u>
12 Octo 1999 (12.10.99)	9903690-7	SE	05 Dece 2000 (05.12.00)

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer

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Telephone No. (41-22) 338.83.38



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 00/01892

## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: B60R 22/20

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: B60R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	DE 2625417 A1 (DAIMLER-BENZ AG), 15 December 1977 (15.12.77), page 7, line 13 - page 8, line 20 --	1-12
Y	EP 0447364 A1 (INDIANA MILLS & MANUFACTURING, INC), 18 Sept 1991 (18.09.91), figure 1, abstract --	1-12
A	DE 4018294 A1 (AUTOLIV-KOLB GMBH & CO KG), 12 December 1991 (12.12.91) --	1,4,8,10,11
A	DE 3539399 A1 (BAYERISCHE MOTOREN WERKE AG), 14 May 1987 (14.05.87) --	1,5-8,10,11

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

## \* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier application or patent but published on or after the international filing date
- "I" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

11 January 2001

Date of mailing of the international search report

22-01-2001

Name and mailing address of the ISA/  
Swedish Patent Office  
Box 5055, S-102 42 STOCKHOLM  
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Telephone No. +46 8 782 25 00

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 00/01892

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A ✓	DE 3222808 A1 (VOLKSWAGENWERK AG), 22 December 1983 (22.12.83)  -----	1,9,11



# INTERNATIONAL SEARCH REPORT

Information on patent family members

04/12/00

International application No.

PCT/SE 00/01892

Patent document cited in search report				Publication date		Patent family member(s)	Publication date
DE	2625417	A1	15/12/77	FR	2353419	A,B	30/12/77
				GB	1542364	A	14/03/79
				US	4173357	A	06/11/79
EP	0447364	A1	18/09/91	CA	2037661	A	13/09/91
				DE	69102723	D,T	22/12/94
				US	5015010	A	14/05/91
DE	4018294	A1	12/12/91	NONE			
DE	3539399	A1	14/05/87	DE	3664198	D	00/00/00
				EP	0221297	A,B	13/05/87
				SE	0221297	T3	
DE	3222808	A1	22/12/83	NONE			

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau(43) International Publication Date  
19 April 2001 (19.04.2001)

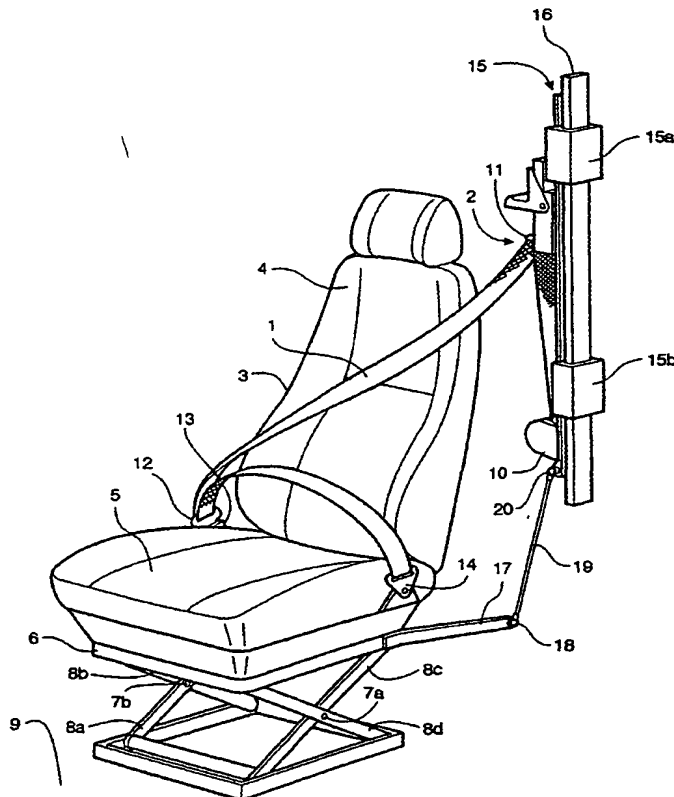
PCT

(10) International Publication Number  
**WO 01/26937 A1**

- (51) International Patent Classification<sup>7</sup>: **B60R 22/20** (74) Agents: ANDERSSON, Per et al.; Albihns Patentbyrå Göteborg AB, Box 142, S-401 22 Göteborg (SE).
- (21) International Application Number: **PCT/SE00/01892**
- (22) International Filing Date: 2 October 2000 (02.10.2000)
- (25) Filing Language: Swedish
- (26) Publication Language: English
- (30) Priority Data:  
9903690-7 12 October 1999 (12.10.1999) SE
- (71) Applicant (for all designated States except US): **VOLVO LASTVAGNAR AB** [SE/SE]; S-405 08 Göteborg (SE).
- (72) Inventors; and
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- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- Published:  
— With international search report.

[Continued on next page]

(54) Title: ARRANGEMENT AND METHOD FOR HEIGHT ADJUSTMENT OF THE UPPER ATTACHMENT POINT OF A SAFETY BELT



(57) Abstract: The invention relates to an arrangement and a method for height adjustment of the upper attachment point of a safety belt, arranged in a vehicle with a vehicle seat which is spring-mounted in the vertical direction, where the upper attachment point is arranged displaceably in the vertical direction on the body of the vehicle. Said height adjustment takes place as a function of the springing movement of the vehicle seat, which results in the upper attachment point always remaining correctly positioned in the vertical direction.

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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

## TITLE

Arrangement and method for height adjustment of the upper attachment point of a safety belt.

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## TECHNICAL FIELD

The present invention relates to an arrangement and a method for height adjustment of the upper attachment point of a safety belt, arranged in a vehicle with a vehicle seat which is spring-mounted in the vertical direction.

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## BACKGROUND ART

Height-adjusting arrangements for the upper attachment point of safety belts in vehicles are previously known. From US 5,102,166, for example, a height-adjusting arrangement for the upper attachment point of a safety belt is previously known, where the movement of the attachment point is a function of the movement in the longitudinal direction of the vehicle of a seat arranged in the vehicle. The movement of the seat is transmitted via a wire to a slide which runs in a vertical guide groove which is arranged in the body of the vehicle and is positioned at shoulder height of a person sitting in said seat.

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Said guide groove comprises an upper and a lower end-position stop, which stops prevent the upper attachment point of the safety belt ending up too high or, respectively, low when the seat is located in its rear or, respectively, front position. The arrangement described above therefore means that when, for example, a tall person moves the seat backwards so as to achieve a suitable driving position, the upper attachment point is displaced upwards and in this manner takes up a position in the vertical direction which is optimum for said person.

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However, this previously known height-adjusting arrangement has the disadvantage that the movement of the upper attachment point of the safety belt takes place only as a function of the movement of the seat in the longitudinal direction of the vehicle. As it is common, in particular in lorries,

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buses and various types of utility vehicle, to provide vehicle seats with spring-mounting in the vertical direction in order to improve the comfort of occupants of the vehicles, the height of the vehicle seat should also be taken into consideration for satisfactory adjustment of the upper attachment point of the safety belt.

From EP 447,364, it is previously known, in a vehicle with a vehicle seat which is spring-mounted in the vertical direction, to arrange the upper attachment point of the safety belt on the backrest of the vehicle seat, which results in the attachment point being correctly positioned irrespective of the springing movement of the vehicle seat.

Although the known arrangement provides good adaptation of the upper attachment point of the safety belt during the springing movement of said vehicle seat, it suffers from certain disadvantages. One disadvantage is that the construction of the vehicle seat is relatively complicated as it has to be provided with strong reinforcements. Another disadvantage is that the vehicle seat usually has to be provided with means, for example a wire extending between the vehicle seat and the floor of the vehicle, in order to limit the springing movement in the event of, for example, heavy braking of the vehicle. Furthermore, the abovementioned arrangement means that the floor of the vehicle has to be reinforced, which increases the weight of the vehicle.

#### DISCLOSURE OF INVENTION

The principal object of the present invention is therefore to provide an arrangement and a method for height adjustment of the upper attachment point of a safety belt, arranged in a vehicle with a vehicle seat which is spring-mounted in the vertical direction, where the upper attachment point is arranged so as to follow in the vertical direction the springing movement of said vehicle seat. This is achieved by means of an arrangement and a method of the type referred to in the introduction, the characteristic features of which emerge from independent claims 1 and 11.

Further advantages and objects of the invention can be understood with the aid of the claims below and the description below.

## BRIEF DESCRIPTION OF DRAWINGS

5 The invention is described below in connection with preferred exemplary embodiments and the appended figures, in which

Figure 1 shows a vehicle seat on which a first preferred embodiment according to the invention can be seen,

10 Figure 2 shows a height-adjustable deflection means of the present invention,

Figure 3 shows, partly in cross section, an operating lever with an associated locking pin in the released position,

15 Figure 4 shows, partly in cross section, said operating lever with the locking pin in the locked position,

Figure 5 shows a vehicle seat with an advantageous alternative embodiment of the present invention, and

Figure 6 shows a vehicle seat on which a further advantageous alternative embodiment according to the invention can be seen.

20

## MODE FOR CARRYING OUT THE INVENTION

Figure 1 shows a height-adjusting arrangement for the upper attachment point 2 of a safety belt 1 on a vehicle seat 3 which is arranged in a vehicle and comprises a backrest 4 and a sitting surface 5 attached to a seat underframe 6. The vehicle seat 3 is spring-mounted by means of a mounting arrangement having two pairs of intersecting link arms 8a, 8b, 8c, 8d interconnected in an articulated manner at points of intersection 7a, 7b, the link arm pairs 8a, 8b and 8c, 8d being arranged on opposite sides of the sitting surface 5 of the vehicle seat and being at their ends connected in such a manner to the seat underframe 6 and the vehicle floor 9 that the vehicle seat 3 is movable in the vertical direction relative to the vehicle floor 9, in addition to which spring means (not shown) are arranged so as to counteract

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the movement of the vehicle seat 3 in the direction towards the vehicle floor 9. A description of a vehicle seat according to the above is given in Swedish patent specification SE 366 505 which is incorporated herewith.

5 Figure 1 also shows how the safety belt 1 runs out of a belt reel 10, and via an upper deflection means 11 arranged at said upper attachment point 2. From the deflection means 11, the belt extends, over the shoulder of an imaginary occupant, to a second, lower deflection means 12 with an associated belt lock 13, which is arranged in a fixed manner in relation to the  
10 sitting surface 5, and on, over the hip of an imaginary occupant, to a lower attachment point 14 arranged in a fixed manner in relation to the sitting surface.

According to a preferred embodiment, the upper deflection means 11 and the  
15 belt reel 10 are mounted in a fixed manner on a slide 15 which is arranged displaceably on a guide rail 16. The slide 15 surrounds the guide rail 16, which is of rectangular cross section, by means of sliding joints 15a, 15b which are shaped so as essentially to surround the guide rail 16 and are therefore designed with a corresponding rectangular cross section.

20 A first link arm 17 is attached rigidly to the seat underframe 6 and connected, via a link arm articulation 18, to a second link arm 19 which is in turn connected to the slide 15 by means of an articulated connection 20, springing movement of the vehicle seat 3 then bringing about displacement of the slide  
25 15 and thus of the deflection means 11 arranged at the upper attachment point 2.

Figures 2, 3 and 4 show an especially preferred embodiment where the upper deflection means 11 is arranged adjustably in the vertical direction  
30 relative to the slide 15. In the embodiment shown, the upper deflection means 11 is attached by a screw connection 21 to a second slide 22 arranged displaceably on the slide 15. Said second slide 22 is provided with

a locking mechanism comprising a locking pin 23 which is operated by an operating lever 24 which is attached pivotably at an articulation 25. When the lever is operated counter to spring means (not shown), the locking pin 23 is brought out of engagement with locking holes 26 arranged in the slide 15, movement of the slide 22 relative to the slide 15 then being made possible. As a result, it is possible to adjust the upper attachment point 2 to the desired height depending on the load (the weight of the occupant) on the sitting surface 5 and the height of the occupant.

10 With reference to Figure 5, an advantageous alternative embodiment for transmitting the springing movement of the vehicle seat 3 to the upper attachment point 2 of the safety belt according to the invention is described. In this embodiment, what is known as a push-pull cable 27, that is to say a cable consisting of an outer covering 28 and a wire 29 which can transmit  
15 both tensile and compressive force, is arranged so as to transmit the springing movement of the vehicle seat to the upper attachment point 2. One end of the wire 29 is attached to a wire attachment 30 arranged in a fixed manner in relation to the vehicle floor 9, and its other end is attached to the slide 15, in addition to which one end of the outer covering 28 is attached  
20 firmly to an attachment 31 arranged in a fixed manner in relation to the seat underframe 6, and its other end is attached to an attachment 32 arranged in a fixed manner in relation to the guide rail 16.

Figure 5 also shows an advantageous alternative embodiment, according to  
25 the present invention, of the upper attachment point 2 of the safety belt, where the safety belt 1 runs out of a belt reel 10, over the shoulder of an imaginary occupant and, as already mentioned, on down to the second, lower deflection means 12. The result of this is that no upper deflection means is required and that the total length of the safety belt 1 can be made  
30 shorter.



Figure 6 shows a further advantageous alternative embodiment for transmitting the springing movement of the vehicle seat 3 to the upper attachment point 2 of the safety belt according to the invention. In this embodiment, a first hydraulic piston/cylinder assembly 33 is arranged between the seat underframe 6 and the vehicle floor 9, and a second hydraulic piston/cylinder assembly 34 is arranged between the slide 15 and the guide rail 16. Said first and second hydraulic piston/cylinder assemblies 33, 34 are coupled to one another, by a hydraulic pipe/tube, so that compression of the first hydraulic piston/cylinder assembly results in a corresponding linear expansion of the second hydraulic piston/cylinder assembly, and the slide 15 is thus displaced.

The invention is not limited to the exemplary embodiments described above and shown in the figures, but can be varied within the scope of the claims below. For example, the springing movement of the vehicle seat can be detected by an electric sensor and then recreated, at the upper attachment point of the safety belt, by an electric motor. Furthermore, said guide rail and slide can be designed with a different, for example circular, cross section.

## CLAIMS

1. Height-adjusting arrangement for the upper attachment point (2) of a safety belt (1), arranged in a vehicle with a vehicle seat (3) which is spring-mounted in the vertical direction, characterized in that the upper attachment point (2) is arranged displaceably in the vertical direction on the body of the vehicle and is connected to said vehicle seat (3) via movement-transmitting means (17, 18, 19, 20; 27; 33, 34, 35) which cause the springing movement of the vehicle seat (3) to bring about a corresponding displacement of said upper attachment point (2). ✓
2. Height-adjusting arrangement for the upper attachment point (2) of a safety belt (1) according to claim 1, characterized in that said movement-transmitting means (17, 18, 19, 20; 27; 33, 34, 35) comprise a link arm arrangement (17, 18, 19, 20) arranged between the vehicle seat (3) and the upper attachment point (2). ✓
3. Height-adjusting arrangement for the upper attachment point (2) of a safety belt (1) according to claim 2, characterized in that said movement-transmitting means (17, 18, 19, 20; 27; 33, 34, 35) comprise a first link arm (17) attached to the vehicle seat (3) and connected, via a link arm articulation (18), to a second link arm (19) which is connected to said upper attachment point (2). ✓
4. Height-adjusting arrangement for the upper attachment point (2) of a safety belt (1) according to claim 1, characterized in that said movement-transmitting means (17, 18, 19, 20; 27; 33, 34, 35) comprise a push-pull cable (27), the first end (30, 31) of which is connected to the vehicle seat (3) and the second end (32) of which is connected to the upper attachment point (2). ✓

5. Height-adjusting arrangement for the upper attachment point (2) of a safety belt (1) according to claim 1, characterized in that said movement-transmitting means (17, 18, 19, 20; 27; 33, 34, 35) comprise a first hydraulic arrangement (33) arranged on the vehicle seat (3) and a second hydraulic arrangement (34) arranged at the upper attachment point (2) and a hydraulic circuit (35) which interconnects said first and second hydraulic arrangements (33, 34). ✓
6. Height-adjusting arrangement for the upper attachment point (2) of a safety belt (1) according to claim 5, characterized in that said first hydraulic arrangement comprises a hydraulic piston/cylinder assembly (33) arranged on the vehicle seat (3). ✓
7. Height-adjusting arrangement for the upper attachment point (2) of a safety belt (1) according to claim 5 or 6, characterized in that said second hydraulic arrangement comprises a hydraulic piston/cylinder assembly (34) arranged at the upper attachment point (2). ✓
8. Height-adjusting arrangement for the upper attachment point (2) of a safety belt (1) according to any one of the preceding claims, characterized in that the upper attachment point (2) is arranged in a fixed manner on a slide (15) which is arranged displaceably on a guide rail (16). ✓
9. Height-adjusting arrangement for the upper attachment point (2) of a safety belt (1) according to any one of the preceding claims, characterized in that a belt reel (10) is arranged at the upper attachment point (2). ✓
10. Height-adjusting arrangement for the upper attachment point (2) of a safety belt (1) according to any one of the preceding claims, ✓

characterized in that the upper attachment point (2) comprises a deflection means (11) for the safety belt (1). ✓

11. Method for height adjustment of the upper attachment point of a safety belt, arranged in a vehicle with a vehicle seat which is spring-mounted in the vertical direction, characterized in that said height adjustment takes place as a function of the vertical springing movement of the vehicle seat. ✓
- 10 12. Method for height adjustment of the upper attachment point of a safety belt according to claim 11, characterized in that the height adjustment takes place as a linear function of the springing movement of the vehicle seat. ✓

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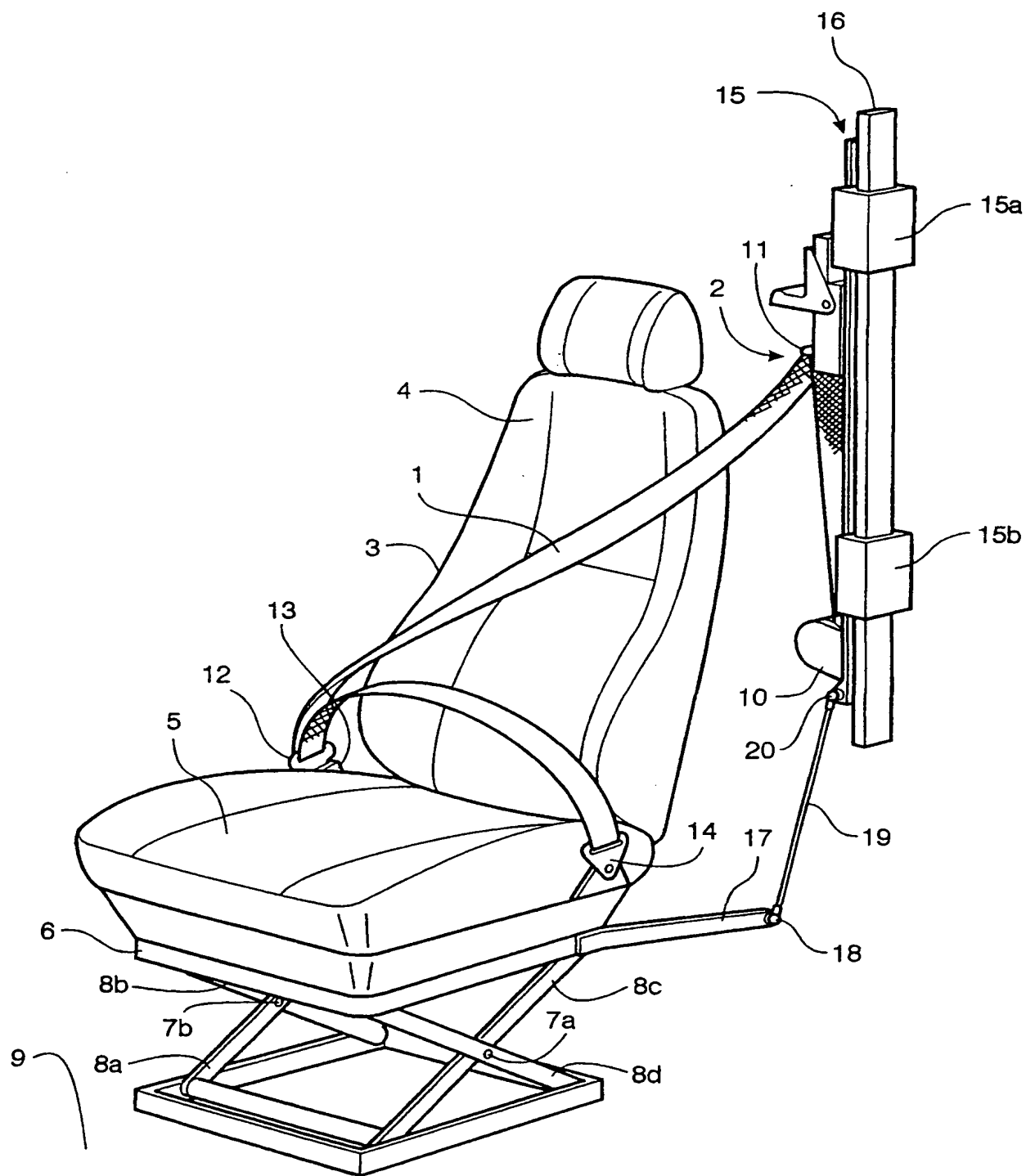


Fig.1

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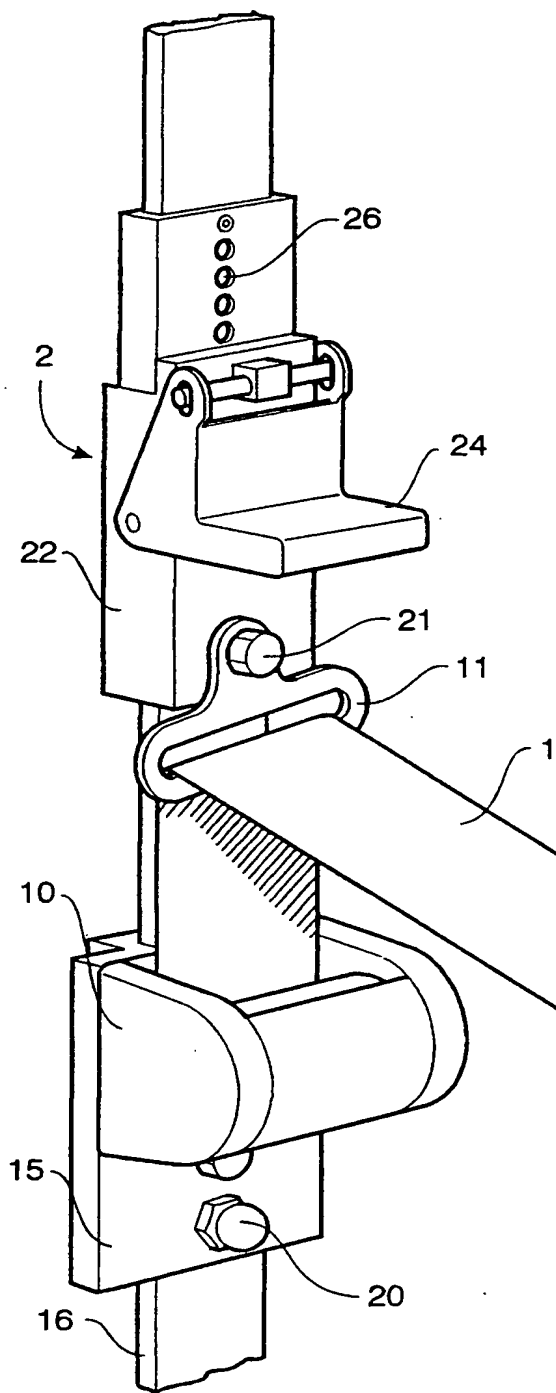


Fig.2

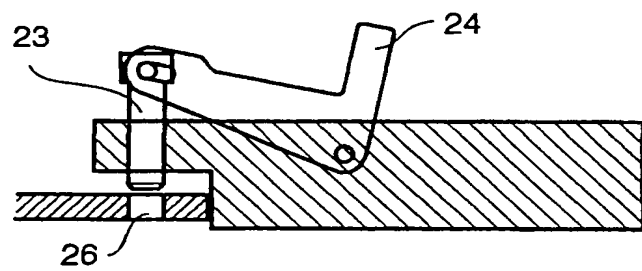


Fig.3

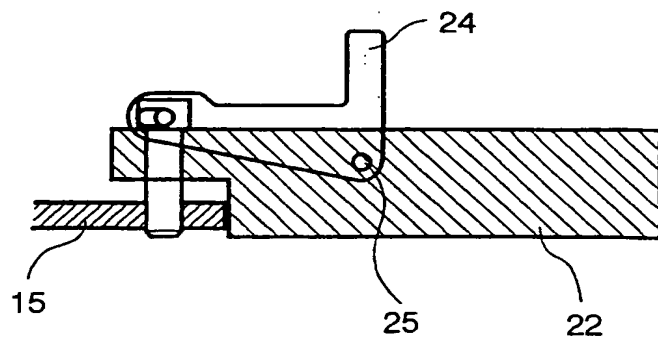


Fig.4

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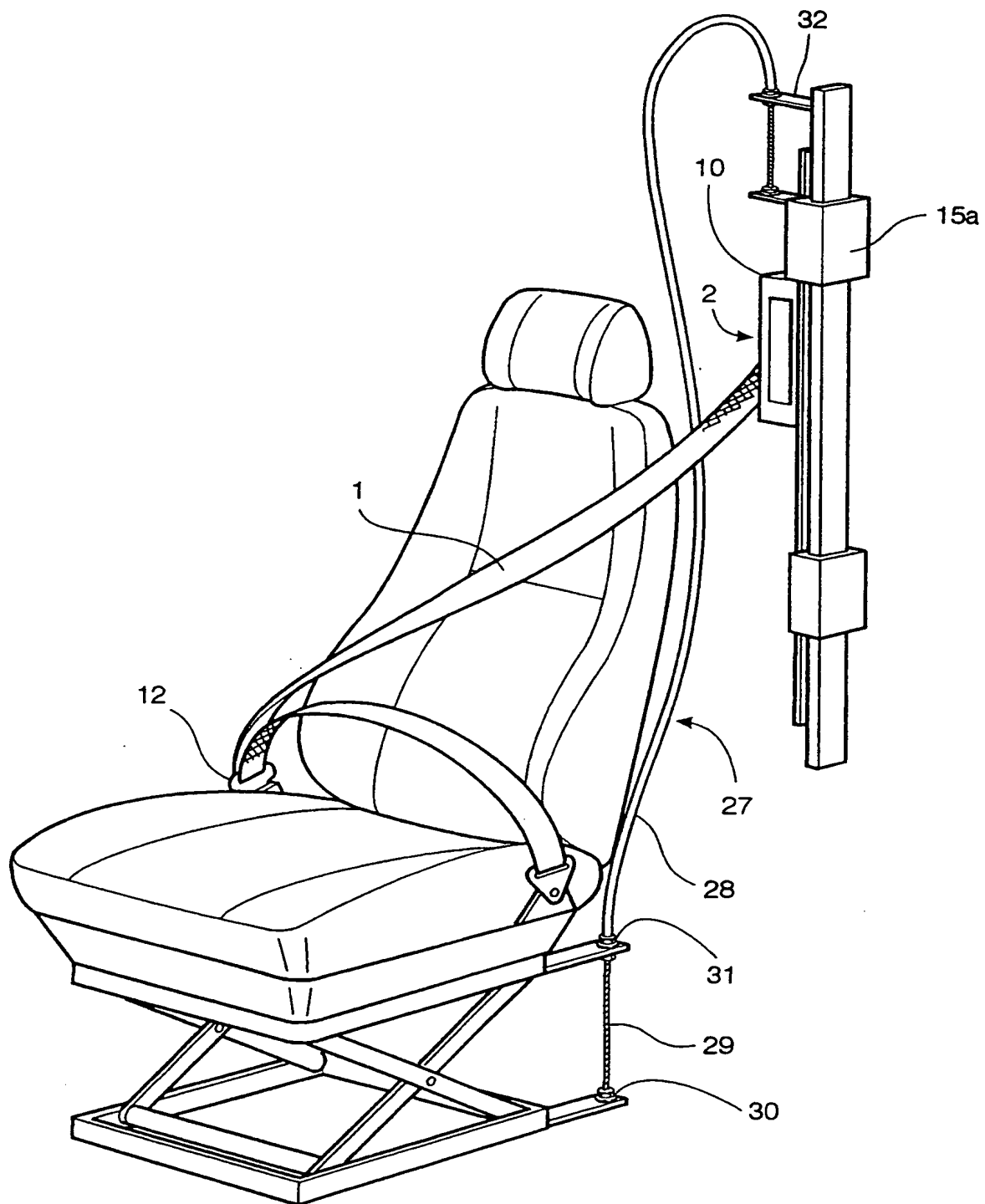


Fig.5

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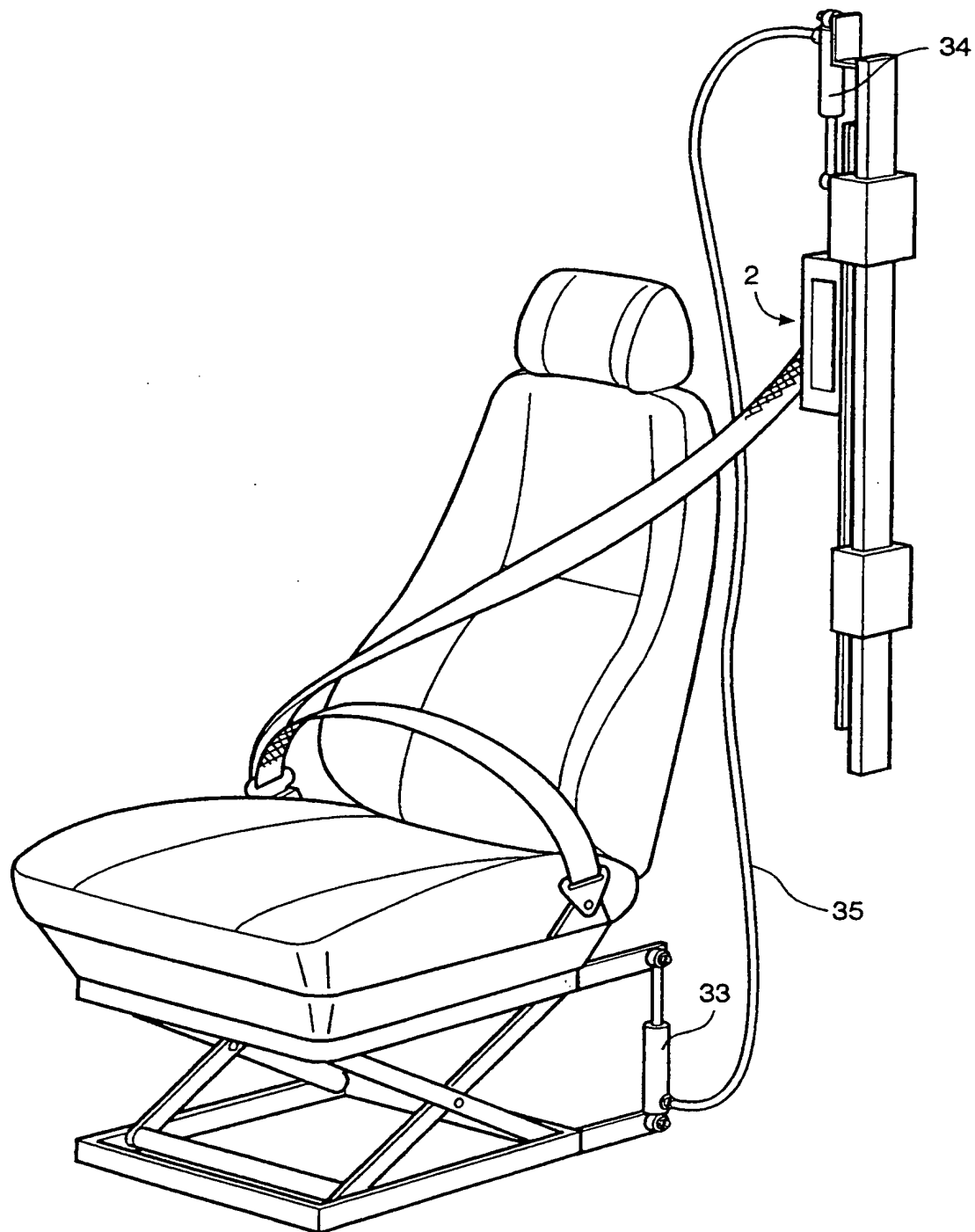


Fig.6



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 00/01892

## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: B60R 22/20

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: B60R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	DE 2625417 A1 (DAIMLER-BENZ AG), 15 December 1977 #1 (15.12.77), page 7, line 13 - page 8, line 20 --	1-12
Y	EP 447364 A1 (INDIANA MILLS & MANUFACTURING, INC), #2 18 Sept 1991 (18.09.91), figure 1, abstract --	1-12
A	DE 4018294 A1 (AUTOLIV-KOLB GMBH & CO KG), #3 12 December 1991 (12.12.91) --	1,4,8,10,11
A	DE 3539399 A1 (BAYERISCHE MOTOREN WERKE AG), #4 14 May 1987 (14.05.87) --	1,5-8,10,11

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"I" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;" document member of the same patent family

Date of the actual completion of the international search

11 January 2001

Date of mailing of the international search report

22-01-2001

Name and mailing address of the ISA/

Swedish Patent Office

Box 5055, S-102 42 STOCKHOLM

Facsimile No. +46 8 666 02 86

Authorized officer

Hans Nordström/CF

Telephone No. +46 8 782 25 00

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 00/01892

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>DE 3222808 A1 (VOLKSWAGENWERK AG), 22 December 1983 (22.12.83)</p> <p>--- -----</p>	1,9,11

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

04/12/00

International application No.  
PCT/SE 00/01892

Patent document cited in search report				Publication date		Patent family member(s)	Publication date
DE	2625417	A1	15/12/77	FR	2353419 A,B	30/12/77	
				GB	1542364 A	14/03/79	
				US	4173357 A	06/11/79	<u>2</u>
EP	0447364	A1	18/09/91	CA	2037661 A	13/09/91	
				DE	69102723 D,T	22/12/94	
				US	5015010 A	14/05/91	<u>2</u>
DE	4018294	A1	12/12/91	NONE			
DE	3539399	A1	14/05/87	DE	3664198 D	00/00/00	
				EP	0221297 A,B	13/05/87	
				SE	0221297 T3		
DE	3222808	A1	22/12/83	NONE			

# RECORD COPY

## REQUEST

The undersigned request that the present international application be processed according to the Patent Cooperation Treaty.

For receiving office use only	
International Application No.	PCT/SE 00 / 0 1 8 9 2
International Filing Date	0 2 -10- 2000
<div style="border: 1px solid black; padding: 2px; display: inline-block;"> The Swedish Patent Office PCT International Application </div>	
Name of receiving Office and "PCT International Application"	

Applicant's or agent's file reference 112111 PA  
(if desired) (12 characters maximum)

<b>Box No. I</b>	<b>TITLE OF INVENTION</b>	
	Device and method for vertical adjustment of an upper fastening point of a safety belt	
<b>Box No. II</b>	<b>APPLICANT</b>	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.)		<input type="checkbox"/> This person is also inventor.
Volvo Lastvagnar AB SE-405 08 GÖTEBORG Sweden		Telephone No.  Facsimile No.  Teleprinter No.
State (that is, country) of nationality: SE		State (that is, country) of residence: SE
This person is the applicant for the purposes of: <input type="checkbox"/> all designated States <input checked="" type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box		
<b>Box No. III</b>	<b>FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)</b>	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.)		This person is:
TOLFSEN Ulf Torsnesveien 101 NO-1634 GAMLE FREDRIKSTAD Norge		<input type="checkbox"/> applicant only <input checked="" type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)
State (that is, country) of nationality: NO		State (that is, country) of residence: NO
This person is the applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box		
<input checked="" type="checkbox"/> Further applicants and/or (further) inventors are indicated on a continuation sheet.		
<b>Box No. IV</b>	<b>AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE</b>	
The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:		<input checked="" type="checkbox"/> agent <input type="checkbox"/> common representative
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)		Telephone No. +46 31 725 81 00
ANDERSSON Per, BERGQUIST Gunnar, BRUN Jonny, GRAUDUMS Valdis, HARRISON Michael, MOSSMARK Anders, OLSSON Stefan, ROMARE Anette, ROSANDER Bengt, SCHLOSSMAN Ulf, SÖRSDAHL Petter ALBIHNS PATENTBYRÅ GÖTEBORG AB, P.O. Box 142, S-401 22 GÖTEBORG, Sweden		Facsimile No. +46 31 711 95 55
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<input type="checkbox"/> Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.		

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HORSRUD Johan  
Kjærrebuen 22  
NO-1626 MANSTAD  
Norge

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality: NO

State (i.e. country) of residence: NO

This person is the applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: *Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.)*

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:

State (i.e. country) of residence:

This person is the applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: *Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.)*

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:

State (i.e. country) of residence:

This person is the applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: *Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.)*

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:

State (i.e. country) of residence:

This person is the applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on a continuation sheet.

**Box No. V DESIGNATION STATES**

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

**Regional Patent**

- ☒ **AP** **ARIPO Patent:** GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting state of the Harare Protocol and of the PCT
- ☒ **EA** **Eurasian Patent:** AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ **EP** **European Patent:** AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is Contracting State of the European Patent Convention and of the PCT
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**National Patent (if other kind of protection or treatment desired, specify on dotted line):**

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| <input checked="" type="checkbox"/> <b>CA</b> Canada                                      | <input checked="" type="checkbox"/> <b>MZ</b> Mozambique   |
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| <input checked="" type="checkbox"/> <b>DM</b> Dominica                                    | <input checked="" type="checkbox"/> <b>SE</b> Sweden   |
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| <input checked="" type="checkbox"/> <b>GB</b> United Kingdom                              | <input checked="" type="checkbox"/> <b>TJ</b> Tajikistan .....   |
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| <input checked="" type="checkbox"/> <b>GH</b> Ghana .....                                 | <input checked="" type="checkbox"/> <b>TT</b> Trinidad and Tobago .....  |
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| <input checked="" type="checkbox"/> <b>HU</b> Hungary .....                               | <input checked="" type="checkbox"/> <b>UG</b> Uganda .....   |
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| <input checked="" type="checkbox"/> <b>IL</b> Israel .....                                | <input checked="" type="checkbox"/> <b>UZ</b> Uzbekistan .....   |
| <input checked="" type="checkbox"/> <b>IN</b> India                                       | <input checked="" type="checkbox"/> <b>VN</b> Viet Nam .....   |
| <input checked="" type="checkbox"/> <b>IS</b> Iceland                                     | <input checked="" type="checkbox"/> <b>YU</b> Yugoslavia .....   |
| <input checked="" type="checkbox"/> <b>JP</b> Japan .....                                 | <input checked="" type="checkbox"/> <b>ZA</b> South Africa .....   |
| <input checked="" type="checkbox"/> <b>KE</b> Kenya .....                                 | <input checked="" type="checkbox"/> <b>ZW</b> Zimbabwe .....   |
| <input checked="" type="checkbox"/> <b>KG</b> Kyrgyzstan .....                            | Check boxes reserved for designating States (for the purposes of a national patent) which have become party to the PCT after issuance of this sheet: |
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| <input checked="" type="checkbox"/> <b>KR</b> Republic of Korea .....                     | <input type="checkbox"/>   |
| <input checked="" type="checkbox"/> <b>KZ</b> Kazakstan .....                             | <input type="checkbox"/>   |
| <input checked="" type="checkbox"/> <b>LC</b> Saint Lucia                                 | <input type="checkbox"/>   |
| <input checked="" type="checkbox"/> <b>LK</b> Sri Lanka .....                             | <input type="checkbox"/>   |

**Precautionary Designation Statement:** In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)


<b>Box No. VI PRIORITY CLAIMS</b>		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country:	regional application:* regional Office	international application: receiving Office
item (1) 12 October 1999 <i>12.10.1999</i>	9903690-7	SE		
item (2)				
item (3)				

☒ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s): (1)

\* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See supplemental Box.

<b>Box No. VII INTERNATIONAL SEARCHING AUTHORITY</b>			
<b>Choice of International Searching Authority (ISA)</b> (If two or more international Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used): ISA /SE	<b>Request to use results of earlier search; reference to that search</b> (if an earlier search has been carried out by or requested from the International Searching Authority): Date (day/month/year):      Number      Country (or regional Office) 12 October 1999      99/01361      SE		

<b>Box No. VIII CHECK LIST; LANGUAGE OF FILING</b>	
This international application contains the following number of sheets: request: 4 ✓ description (excluding sequence listing part): 6 ✓ claims: 4 ✓ abstract: 1 ✓ drawings: 4 ✓ sequence listing part of description: _____ Total number of sheets: 19 ✓	This international application is accompanied by the item(s) marked below: 1. <input checked="" type="checkbox"/> fee calculation sheet 2. <input type="checkbox"/> separate signed power of attorney 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: 4. <input type="checkbox"/> statement explaining lack of signature 5. <input type="checkbox"/> priority document(s) identified in Box No. VI as item(s): 6. <input type="checkbox"/> translation of international application into (language): 7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9. <input checked="" type="checkbox"/> other (specify): Copy of ITS-report in SE 9903690-7
Figure of the drawings which should accompany the abstract: Fig. 1	Language of filing of the international application: Swedish

<b>Box No. IX SIGNATURE OR APPLICANT OR AGENT</b>	
Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).	
Göteborg 28 September 2000	
 Per Andersson	

1. Date of actual receipt of the purported international application: 3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application: 4. Date of timely receipt of the required corrections under PCT-Article 11(2): 5. International Searching Authority (if two or more are competent): ISA/SE	For receiving Office use only <div style="text-align: center; font-size: 1.2em;">02-10-2000</div> 2. Drawings: <input checked="" type="checkbox"/> received: <input type="checkbox"/> not received: 6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid
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Date of receipt of the record copy by the International Bureau:	For International Bureau use only <b>14 NOVEMBER 2000</b>	( 14. 11. 00 )
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1/4

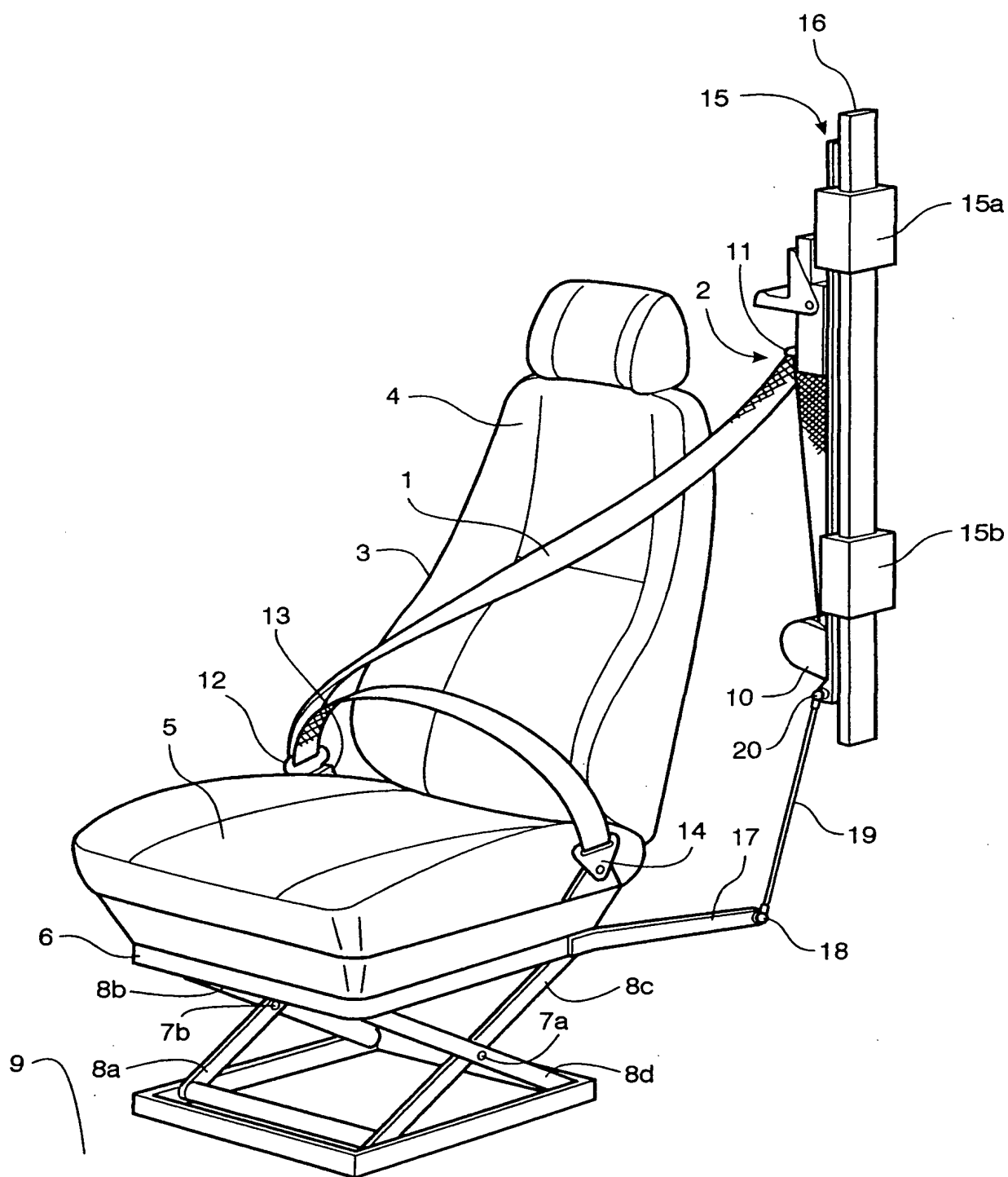


Fig.1



2/4

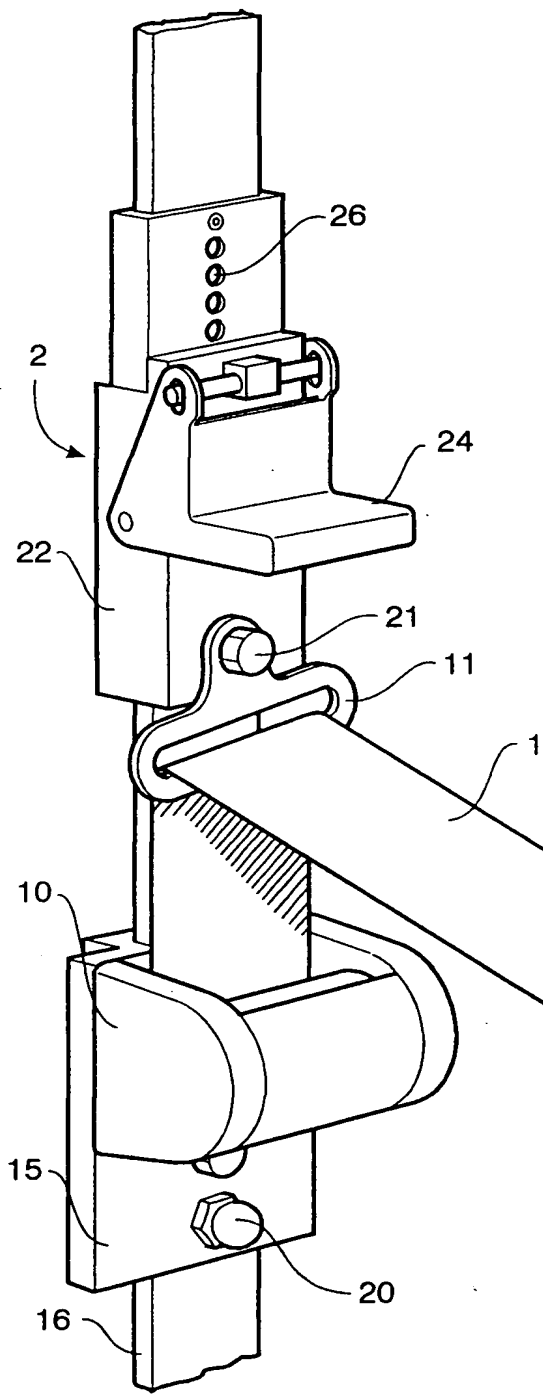


Fig.2

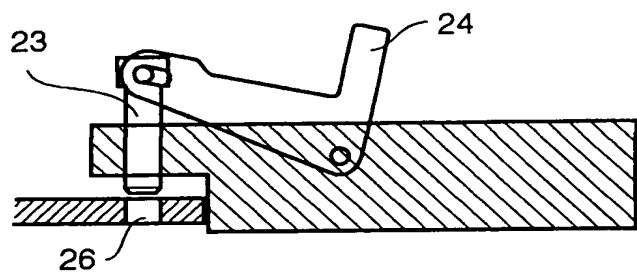


Fig.3

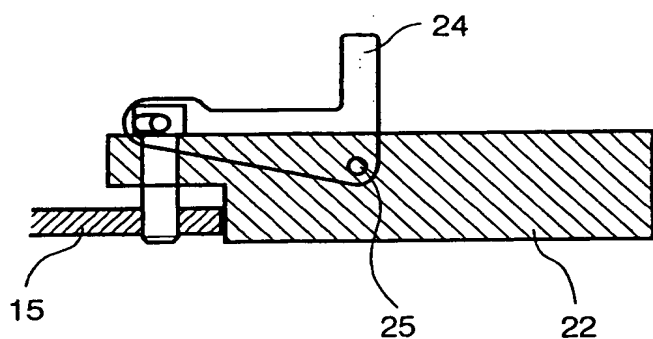


Fig.4

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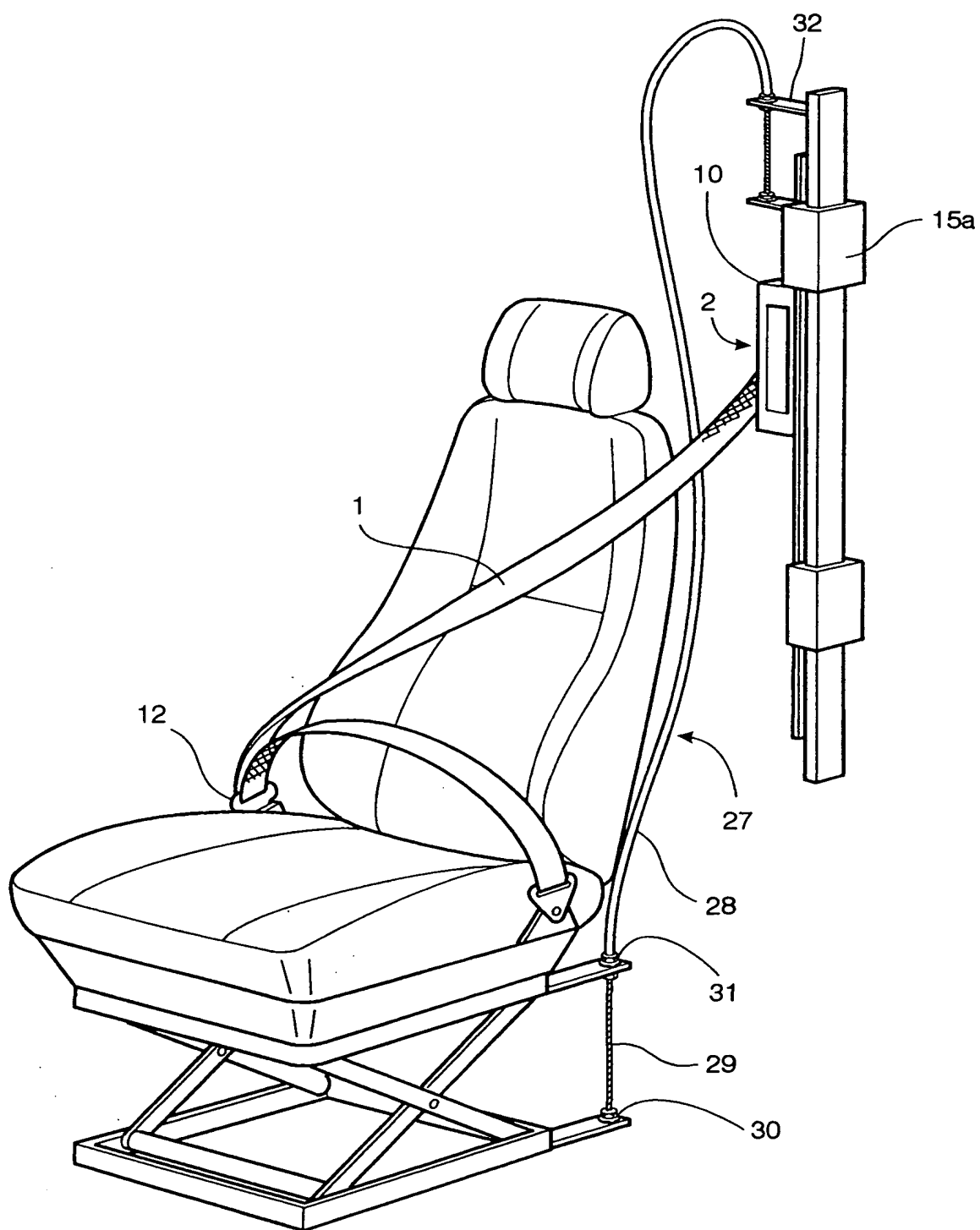


Fig.5

4/4

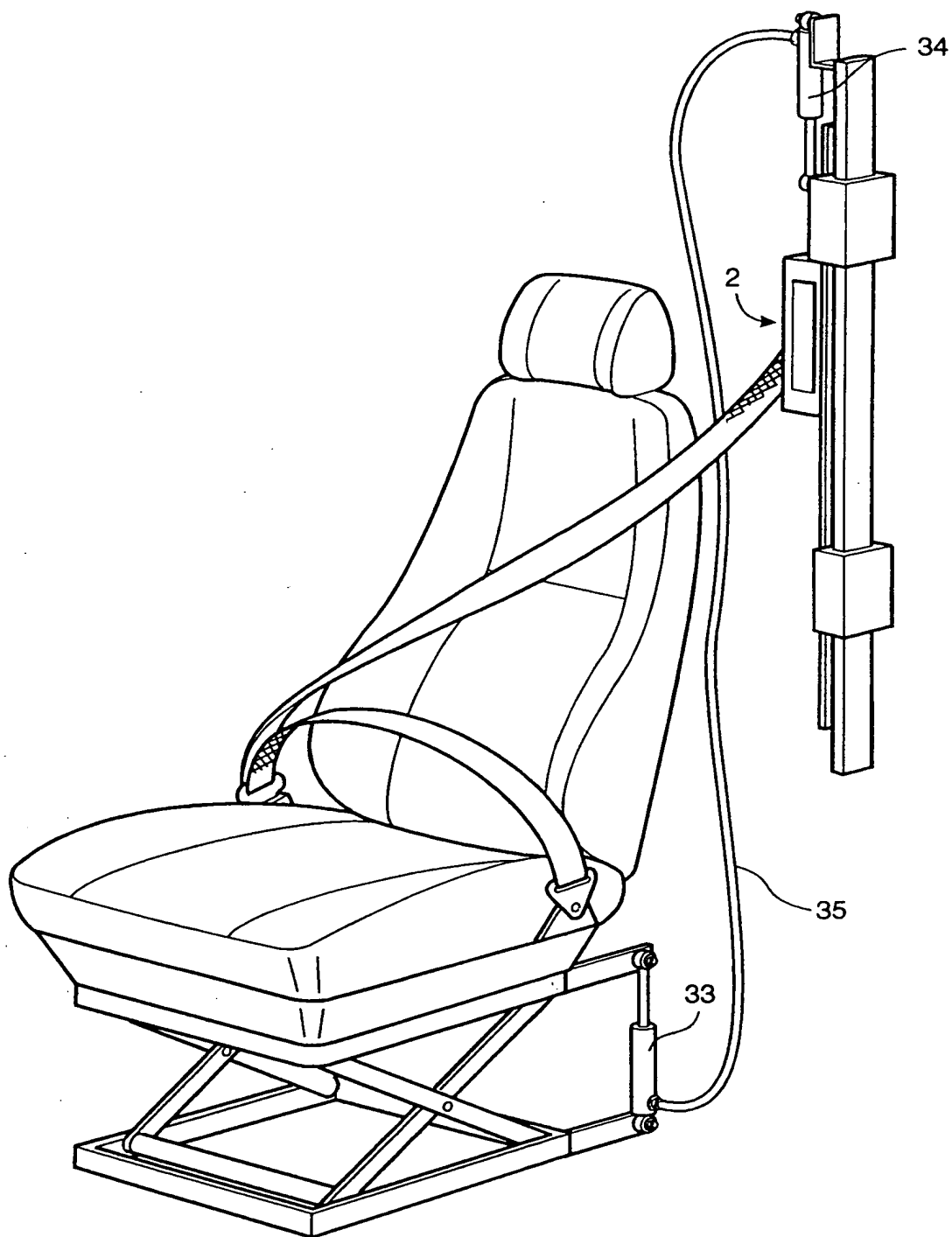


Fig.6

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Titel

Anordning och förfarande för höjdomställning av ett säkerhetsbältes övre fästpunkt.

5

Tekniskt område

Föreliggande uppfinning avser en anordning och ett förfarande för höjdomställning av ett säkerhetsbältes övre fästpunkt, anordnad i ett fordon med en i vertikalled fjädrande upphängd fordonsstol.

10

Teknikens ståndpunkt

Höjdomställande anordningar vid säkerhetsbältens övre fästpunkt i fordon är förut kända.

Från US 5,102,166 är exempelvis förut känt en höjdomställande anordning för ett säkerhetsbältes övre fästpunkt, där förflyttningen av fästpunkten är en funktion av ett i

15 fordonet anordnat sätes förflyttning i fordonets längdriktning. Sätets förflyttning överförs via en vajer till en slid vilken löper i ett vid fordonets kaross anordnat vertikalt styrspår som är positionerat i axelhöjd för en person sittande i nämnda säte. Nämnda styrspår innefattar ett övre och ett nedre ändlägesstopp vilka förhindrar att säkerhetsbältes övre fästpunkt hamnar alltför högt respektive lågt då sätet befinner sig i sin bakre respektive främre position. Ovan  
20 beskrivna anordning medför således att då exempelvis en lång person flyttar sätet bakåt, för att få en bra körställning, förskjuts den övre fästpunkten uppåt och intar på så vis en för nämnda person optimal position i vertikalled.

Denna tidigare kända höjdomställande anordning uppvisar dock nackdelen att säkerhetsbältets

25 övre fästpunkts förflyttning endast sker som funktion av sätets förflyttning i fordonets

längdriktning. Då det är vanligt förekommande, i synnerhet i lastbilar, bussar och olika slag av nyttofordon, att för att förbättra åkandes komfort förse fordonsstolar med i vertikalled fjädrande upphängning, så bör för fullgod inställning av säkerhetsbältets övre fästpunkt även fordonsstolens höjd beaktas.

5

Genom EP 447,364 är det förut känt att, vid ett fordon med en i vertikalled fjädrande upphängd fordonsstol, anordna säkerhetsbältets övre fästpunkt vid fordonsstolens ryggstöd varvid uppnås att fästpunkten förblir rätt placerad oberoende av fordonsstolens fjädringsrörelse.

10

Fastän det kända arrangemanget ger en bra anpassning av säkerhetsbältets övre fästpunkt under nämnda fordonsstols fjädringsrörelse så är det behäftat med vissa nackdelar. En nackdel är att fordonsstolen blir relativt komplicerad till sin uppbyggnad då den måste försees med kraftiga förstärkningar. En annan nackdel är att fordonsstolen vanligtvis måste försees med organ, exempelvis en vajer vilken sträcker sig mellan fordonsstolen och fordonets golv, för att begränsa fjädringsrörelsen vid exempelvis en kraftig inbromsning av fordonet. Vidare medför ovannämnda arrangemang att fordonets golv måste förstärkas vilket ökar fordonets vikt.

15

#### Redogörelse för uppfinningen

20

Det huvudsakliga ändamålet med föreliggande uppfinning är således att tillhandahålla en anordning och ett förfarande för höjdomställning av ett säkerhetsbältes övre fästpunkt, anordnad i ett fordon med en i vertikalled fjädrande upphängd fordonsstol, där den övre fästpunkten är anordnad att i vertikalled följa nämnda fordonsstols fjädringsrörelse. Detta uppnås med en anordning och ett förfarande av i inledningen angivet slag, vars kännetecken

framgår av de självständiga patentkraven 1 och 11.

Ytterligare fördelar och ändamål med uppfinningen kan utläsas med hjälp av de efterföljande patentkraven samt den efterföljande beskrivningen.

5

#### Figurbeskrivning

Uppfinningen kommer i det följande att beskrivas i anslutning till föredragna utföringsexempel samt de bifogade figurerna, där

figur 1        visar en fordonsstol vid vilken en första föredragen utföringsform enligt  
10               uppfinningen framgår,

figur 2        visar ett höjdställbart omlänkingsorgan vid föreliggande uppfinning,

figur 3        visar, delvis i tvärsnitt, en manöverspak med en tillhörande spärrtapp i frigjort  
läge,

figur 4        visar, delvis i tvärsnitt, nämnda manöverspak med spärrtappen i låst läge,

15    figur 5        visar en fordonsstol med en fördelaktig alternativ utföringsform av föreliggande  
uppfinning och

figur 6        visar en fordonsstol vid vilken en ytterligare fördelaktig alternativ utföringsform  
enligt uppfinningen framgår.

#### 20    Föredragen utföringsform

I figur 1 visas en höjdomställande anordning för ett säkerhetsbältes 1 övre fästpunkt 2 vid en i  
ett fordon anordnad fordonsstol 3 vilken innefattar ett ryggstöd 4, en sits 5 fäst vid ett  
stolsunderrede 6. Fordonsstolen 3 är fjädrande upphängd med en upphängningsanordning  
uppvisande två par varandra korsande, i korsningspunkterna 7a, 7b med varandra ledbart

25    förbundna länkar 8a, 8b, 8c, 8d, varvid länkarmparen 8a, 8b respektive 8c, 8d är anordnade

vid motsatta sidor av fordonsstolens sits 5 och vid sina ändar är så förbundna med stolsunderredet 6 respektive fordonsgolvet 9 att fordonsstolen 3 är i vertikalled rörlig relativt fordonsgolvet 9, varjämte ej visade fjäderorgan är anordnade att motverka fordonsstolens 3 rörelse i riktning mot fordonsgolvet 9. En beskrivning av en fordonsstol enligt ovan återfinns i  
5 den svenska patentskriften SE 366 505 vilken härmed inkorporeras.

Figur 1 visar vidare hur säkerhetsbältet 1 löper ut från en bältesrulle 10, över ett vid nämnda övre fästpunkt 2 anordnat övre omlänkingsorgan 11. Från omlänkingsorganet 11 sträcker sig bältet, över axeln på en tänkt åkande, till ett andra nedre omlänkingsorgan 12 med  
10 tillhörande bälteslås 13, vilket är fast anordnat i anslutning till sitsen 5, och vidare, över höften på en tänkt åkande, till en i anslutning till sitsen fast anordnad nedre fästpunkt 14.

Enligt en föredragen utföringsform är det övre omlänkingsorganet 11 och bältesrullen 10 fast monterade vid en slid 15 som är förskjutbart anordnad vid en styrräls 16. Sliden 15 omsluter  
15 styrrälsen 16, utformad med rektangulärt tvärsnitt, medelst glidförband 15a, 15b vilka är utformade att huvudsakligen omsluta styrrälsen 16 och därför utformade med ett motsvarande rektangulärt tvärsnitt.

Vid stolsunderredet 6 är en första länkarm 17 stelt infäst och förbunden, via en länkarmled 18,  
20 med en andra länkarm 19 vilken i sin tur är förbunden med sliden 15 medelst en ledförbindelse 20 varvid fjädringsrörelse hos fordonsstolen 3 åstadkommer förskjutning av sliden 15 och därmed av det vid den övre fästpunkten 2 anordnade omlänkingsorganet 11.

I figur 2, 3 och 4 presenteras en särskilt föredragen utföringsform där det övre  
25 omlänkingsorganet 11 är i vertikalled, relativt sliden 15, inställbart anordnat. I det visade

utförandet är det övre omlänkingsorganet 11 fastsatt med ett skruvförband 21 vid en på sliden 15 förskjutbart anordnad andra slid 22. Nämda andra slid 22 är försedd med en spärrmekanism innefattande en spärrtapp 23 som manövreras med en manöverspak 24 vilken är svängbart infäst vid en led 25. Då spaken manövreras, mot ej visade fjäderorgan, bringas  
5 spärrtappen 23 ur ingrepp med i sliden 15 anordnade spärrhål 26 varvid förflyttning av sliden 22 relativt sliden 15 möjliggörs. Härigenom är det möjligt att, i beroende av belastningen på sitsen 5 (den åkandes vikt) och den åkandes längd, kunna ställa in den övre fästpunkten 2 i önskad höjd.

10 Under hänvisning till figur 5 beskrivs ett fördelaktigt alternativt utförande för överföring av fordonsstolens 3 fjädringsrörelse till säkerhetsbältets övre fästpunkt 2 enligt uppfinningen. I detta utförande är en så kallad "push-pull"-kabel 27, dvs en kabel bestående av ett yttre hölje 28 och en vajer 29 vilken kan överföra både drag- och tryckkraft, anordnad att överföra fordonsstolens fjädringsrörelse till den övre fästpunkten 2. Vajern 29 är vid sin ena ände  
15 infäst vid ett vajerfäste 30, fast anordnat i anslutning till fordonsgolvet 9, och vid sin andra ände infäst vid sliden 15 varjämte det yttre höljet 28 i sin ena ände är fast infäst vid ett fäste 31, fast anordnat i anslutning till stolsunderredet 6, och i sin andra ände infäst vid ett, i anslutning till styrrälsen 16, anordnat fäste 32.

20 I figur 5 framgår vidare ett fördelaktigt alternativt utförande, enligt föreliggande uppfinning, av säkerhetsbältets övre fästpunkt 2 där säkerhetsbältet 1 löper ut från en bältesrulle 10, över axeln på en tänkt åkande, och, som redan nämnts, vidare ner till det andra nedre omlänkingsorgan 12. Härmed uppnås att inget övre omlänkingsorgan erfordras samt att säkerhetsbältets 1 totala längd kan göras kortare.



- I figur 6 visas ytterligare ett fördelaktigt alternativt utförande för överföring av fordonsstolens 3 fjädringsrörelse till säkerhetsbältets övre fästpunkt 2 enligt uppfinningen. I detta utförande är ett första hydrauliskt kolv/cylinderarrangemang 33 anordnat mellan stolsunderredet 6 och fordonsgolvet 9 och ett andra hydrauliskt kolv/cylinderarrangemang 34 mellan sliden 15 och styrrälsen 16. Nämnda första och andra hydrauliska kolv/cylinderarrangemang 33,34 är 5 kopplade till varandra, med hydraul-rör/slang, så att hoptryckning av det första hydrauliska kolv/cylinderarrangemanget resulterar i en motsvarande längdutvidgning av det andra hydrauliska kolv/cylinderarrangemanget och därmed förskjuts sliden 15.
- 10 Uppfinningen är ej begränsad till de ovan beskrivna och i figurer visade utföringsexempel, utan kan varieras inom ramen för efterföljande patentkrav. Exempelvis kan fordonsstolens fjädringsrörelse detekteras med en elektrisk givare och sedan återskapas, vid det säkerhetsbältets övre fästpunkt, med en elektrisk motor. Vidare kan nämnda styrräls och slid utformas med annat tvärsnitt, exempelvis cirkulärt.

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Patentkrav

1) Höjdomställande anordning för ett säkerhetsbältes (1) övre fästpunkt (2), anordnad i  
5 ett fordon med en i vertikalled fjädrande upphängd fordonsstol (3)

k ä n n e t e c k n a d a v

att den övre fästpunkten (2) är i vertikalled förskjutbart anordnad vid fordonets kaross  
samt är förbunden med nämnda fordonsstol (3) via rörelseöverföringsorgan

(17,18,19,20;27;33,34,35) vilka medför att fordonsstolens (3) fjädringsrörelse

10 åstadkommer en motsvarande förskjutning av nämnda övre fästpunkt (2).

2) Höjdomställande anordning för ett säkerhetsbältes (1) övre fästpunkt (2) enligt

patentkrav 1

k ä n n e t e c k n a d a v

15 att nämnda rörelseöverföringsorgan (17,18,19,20;27;33,34,35) innefattar en mellan

fordonsstolen (3) och den övre fästpunkten (2) anordnad länkarmsanordning

(17,18,19,20).

3) Höjdomställande anordning för ett säkerhetsbältes (1) övre fästpunkt (2) enligt

20 patentkrav 2

k ä n n e t e c k n a d a v

att nämnda rörelseöverföringsorgan (17,18,19,20;27;33,34,35) innefattar en vid

fordonsstolen (3) infäst första länkarm (17) förbunden, via en länkarmled (18), med en

andra länkarm (19) vilken är förbunden med nämnda övre fästpunkt (2).

4) Höjdomställande anordning för ett säkerhetsbältes (1) övre fästpunkt (2) enligt patentkrav 1

k ä n n e t e c k n a d a v

att nämnda rörelseöverföringsorgan (17,18,19,20;27;33,34,35) innefattar en push-pull

5 kabel (27) vars första ände (30,31) är ansluten till fordonsstolen (3) och andra ände (32) är ansluten till den övre fästpunkten (2).

5) Höjdomställande anordning för ett säkerhetsbältes (1) övre fästpunkt (2) enligt patentkrav 1

10 k ä n n e t e c k n a d a v

att nämnda rörelseöverföringsorgan (17,18,19,20;27;33,34,35) innefattar en första hydraulisk anordning (33) anordnad vid fordonsstolen (3) och en andra hydraulisk anordning (34) anordnad vid den övre fästpunkten (2) samt en hydraulisk krets (35) vilken sammanbinder nämnda första och andra hydrauliska anordningar (33,34).

15

6) Höjdomställande anordning för ett säkerhetsbältes (1) övre fästpunkt (2) enligt patentkrav 5

k ä n n e t e c k n a d a v

att nämnda första hydrauliska anordning innefattar ett hydrauliskt

20 kolv/cylinderarrangemang (33) anordnat vid fordonsstolen (3).

7) Höjdomställande anordning för ett säkerhetsbältes (1) övre fästpunkt (2) enligt patentkrav 5 eller 6

k ä n n e t e c k n a d a v

att nämnda andra hydrauliska anordning innefattar hydrauliskt  
kolv/cylinderarrangemang (34) anordnat vid den övre fästpunkten 2.

8) Höjdomställande anordning för ett säkerhetsbältes (1) övre fästpunkt (2) enligt något  
5 av föregående patentkrav

k ä n n e t e c k n a d a v

att den övre fästpunkten (2) är fast anordnad vid en slid (15) vilken förskjutbart  
anordnad vid styrräls (16).

10 9) Höjdomställande anordning för ett säkerhetsbältes (1) övre fästpunkt (2) enligt något  
av föregående patentkrav

k ä n n e t e c k n a d a v

att en bältesrulle (10) är anordnad vid den övre fästpunkten (2).

15 10) Höjdomställande anordning för ett säkerhetsbältes (1) övre fästpunkt (2) enligt något  
av föregående patentkrav

k ä n n e t e c k n a d a v

att den övre fästpunkten (2) innefattar ett omlänkingsorgan (11) för säkerhetsbältet  
(1).

20

11) Förfarande vid höjdomställning av ett säkerhetsbältes övre fästpunkt, anordnad i ett  
fordon med en i vertikal led fjädrande upphängd fordonsstol

k ä n n e t e c k n a t a v

att nämnda höjdomställning sker som funktion av fordonsstolens vertikala

25

fjädringsrörelse.

12) Förfarande vid höjdomställning av ett säkerhetsbältes övre fästpunkt enligt

patentkrav 11

5 k ä n n e t e c k n a t a v

att höjdomställningen sker som en linjär funktion av fordonsstolens fjädringsrörelse.

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#### Sammandrag

- Uppfinningen avser en anordning och ett förfarande för höjdomställning av ett säkerhetsbältes
- 5    övre fästpunkt, anordnad i ett fordon med en i vertikalled fjädrande upphängd fordonsstol, där den övre fästpunkten är i vertikalled förskjutbart anordnad vid fordonets kaross. Nämnade höjdomställning sker som en funktion av fordonsstolens fjädringsrörelse varmed uppnås att den övre fästpunkten alltid förblir, i vertikalled, rätt placerad.

## P A T E N T C O O P E R A T I O N T R E A T Y

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner  
 US Department of Commerce  
 United States Patent and Trademark  
 Office, PCT  
 2011 South Clark Place Room  
 CP2/5C24  
 Arlington, VA 22202  
 ETATS-UNIS D'AMERIQUE  
 in its capacity as elected Office

<b>Date of mailing (day/month/year)</b> 20 June 2001 (20.06.01)	<b>Applicant's or agent's file reference</b> 112111 PA
<b>International application No.</b> PCT/SE00/01892	<b>Priority date (day/month/year)</b> 12 October 1999 (12.10.99)
<b>International filing date (day/month/year)</b> 02 October 2000 (02.10.00)	
<b>Applicant</b> TOLFSEN, Ulf et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:  
 23 April 2001 (23.04.01)

☐ in a notice effecting later election filed with the International Bureau on:  
 \_\_\_\_\_

2. The election ☒ was  
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

<b>The International Bureau of WIPO</b> 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No.: (41-22) 740.14.35	Authorized officer  F. Baechler  Telephone No.: (41-22) 338.83.38
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## PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING  
OF A CHANGE(PCT Rule 92bis.1 and  
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

ANDERSSON, Per  
Albihns Göteborg AB  
Box 142  
S-401 22 Göteborg  
SUÈDE

Date of mailing (day/month/year) 20 June 2001 (20.06.01)	<b>IMPORTANT NOTIFICATION</b>
Applicant's or agent's file reference 112111 PA	
International application No. PCT/SE00/01892	International filing date (day/month/year) 02 October 2000 (02.10.00)

1. The following indications appeared on record concerning:	
<input type="checkbox"/> the applicant	<input type="checkbox"/> the inventor <input checked="" type="checkbox"/> the agent <input type="checkbox"/> the common representative
Name and Address ANDERSSON, Per Albihns Patentbyrå Göteborg AB Box 142 S-401 22 Göteborg Sweden	State of Nationality
	State of Residence
	Telephone No. 46 31 725 81 00
	Facsimile No. 46 31 711 95 55
2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:	
<input type="checkbox"/> the person <input type="checkbox"/> the name <input checked="" type="checkbox"/> the address <input type="checkbox"/> the nationality <input type="checkbox"/> the residence	
Name and Address ANDERSSON, Per Albihns Göteborg AB Box 142 S-401 22 Göteborg Sweden	State of Nationality
	State of Residence
	Telephone No. 46 31 725 81 00
	Facsimile No. 46 31 711 95 55
3. Further observations, if necessary: <b>The indication of a new address of the agent on the Demand (Form PCT/IPEA/401) has been considered a request for recording a change under Rule 92bis. In case of disagreement, the International Bureau should be notified immediately.</b>	
4. A copy of this notification has been sent to:	
<input checked="" type="checkbox"/> the receiving Office	<input type="checkbox"/> the designated Offices concerned
<input type="checkbox"/> the International Searching Authority	<input checked="" type="checkbox"/> the elected Offices concerned
<input checked="" type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer F. Baechler Telephone No.: (41-22) 338.83.38
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